



Limits and Opportunities of Consumer Information through Product Labelling

with a special focus on the US Energy Star

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Research project on behalf of the:
Federal Institute for Risk Assessment (BfR), Berlin / Germany

Project Focus

Key Question

- Effectiveness of product labelling on consumers ?

Objectives

- 1: Stocktaking of product labels in Germany, USA, Sweden for food, consumer products and chemicals >> „**Label landscape**“
- 2: Compilation and evaluation of the latest findings on the effectiveness of product labels >> „**Effectiveness of product labelling**“
- 3: Drawing conclusions for consumer communication via product labelling

• Methodology:

- Search for labels and literature + meta analysis via *desk research*

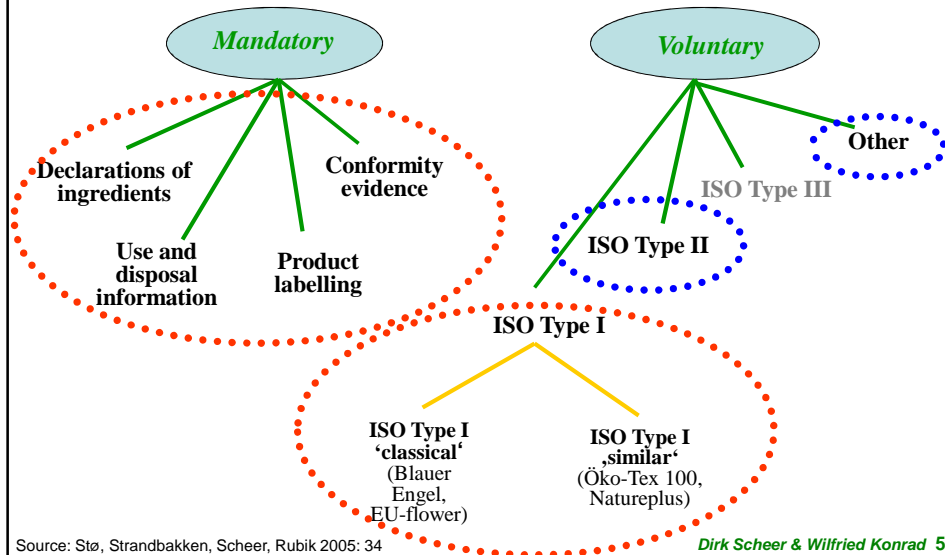
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Product information – why and what for?

- Information **asymmetries** supply vs. demand
 - search attributes
 - experience attributes
 - credence attributes
- **(Simple)** communication about **hidden** product features (quality, environment, health)
- **Decision support** for actors (especially consumers)
- **Competitive advantage** for producers? – broaden the range of products with „consumer-friendly“ products

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Product information – which ones?



2. „Label Landscape“

Label landscapes: methodology

- **Goal**
 - comprehensive list of existing product labels in Germany, Sweden, USA
- **Methodology**
 - **Step 1:** Search for product labels
 - Websites of state institutions, economic and civil society organisations
 - Branch search (exemplary products and keywords)
 - Screening of IÖW studies
 - **Step 2:** Selection and description of exemplary product labels
 - Selection criteria consumer health protection
 - Exemplary selection in 2 cases:
 - Label awarding agency issues several of similar labels
 - Labels with regional scope
 - **Step 3:** Tables of product labels („label landscapes“)
 - Classification scheme for depiction of „label landscapes“
 - Characterisation of product labels

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Label landscape – showing the results

- **Concept for depiction – approach „meta-product groups“**

1) Cross-product group	4) Household & Care
2) Food, Alcohol & Tobacco	5) Clothes & Textiles
3) Building & Habitation	6) Work & Leisure

- **Characterisation of labels – approach „Category Development“**

1) Scope	5) Objective
2) Labelling, web address	6) Products
3) Year of introduction	7) Criteria
4) Format	8) Certifier

- **Depiction of results**

- Not representative / country 1 >> voluntary & mandatory; country 2 ...

Scope	Label	Year of introduction	Format	Objective	Products	Criteria	Certifier (encoded)	
Germany								
Voluntary Labels								
(1)	DE	Stiftung Warentest www.test.de/	1966	Picture + Text as comparative quality evaluation	Health, partly environment	Various products & services	Evaluation of usability, safety or quality (specific criteria for each product group)	Government (for independent consumer information)

Label landscapes 1 - „Cross-Product Group“

- **Quantities**
 - 28 labels
- **Observations**
 - Product comparisons, eco-labels and conformity labels
- **Characterisation**
 - **Scope:** national boundaries
 - **Introduction:** conformity labels / product comparisons old – eco-labels new
 - **Format:** pictorial mark, plus additional text (label name)
 - **Products:** wide range of consumer products
 - **Criteria:** statutory provisions (conformity labels) vs. „beyond regulation“ (eco-labels, comparative product test)



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Label landscapes 2 - „Food, Alcohol & Tobacco“

- **Quantities**
 - 69 labels
- **Observations**
 - Individual product safety vs. collective or externalised objectives
- **Characterisation**
 - **Scope:** national + regional
 - **Introduction:** eco-labels 1980s; food safety 1990s
 - **Format:** combinations (hints to regional origin)
 - **Products:** 1) organic products; 2) specific products (third world origin; „sensitive“ products)
 - **Criteria:** production methods, product quality



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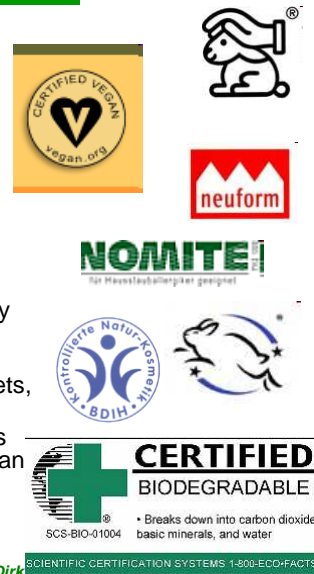
Label landscapes 3 - „Building & Habitation“

- **Quantities**
 - 35 Labels
- **Observations**
 - Wide range of labels in Germany
 - labelling of singular product features is rare, conformity and mandatory labels
- **Characterisation**
 - **Scope:** national + international
 - **Introduction:** since 1990s (catchword healthy living)
 - **Format:** combinations of picture + text
 - **Products:** raw materials (timber); finished products (building and auxiliary materials, floor coverings); specific product groups (mattresses, carpets, furniture)
 - **Criteria:** avoidance of pollutants; social criteria (carpets)



Label landscapes 4 - „Household & Care“

- **Quantities**
 - 17 labels
- **Observations**
 - Wide range of labels in Germany
 - Prevalence of voluntary labels
- **Characterisation**
 - **Scope:** national
 - **Introduction:** Germany since 2000s, USA during 1990s
 - **Format:** combinations of picture + text; mandatory labelling: declaration of ingredients, sorting instructions for waste management
 - **Products:** highly specific (cosmetics, feather duvets, cleaning products)
 - **Criteria:** raw materials from organic farming; bans for mineral oil products and animal ingredients; ban on animal experiments and genetic engineering



Label landscapes 5 - „Clothing & Textiles“

- **Quantities**
 - 18 Labels
- **Observations**
 - Wide range of labels in Germany
 - Trend certification of organic cotton
- **Characterisation**
 - **Scope:** rather international
 - **Introduction:** since 1990s
 - **Format:** combinations of picture + text; additions (test number, test institute, natural textile, advertising slogans)
 - **Products:** only textiles
 - **Criteria:** raw materials from organic farming; avoidance of pollutants, partly contextual factors like environmental management system



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Label landscapes 6 - „Work & Leisure“

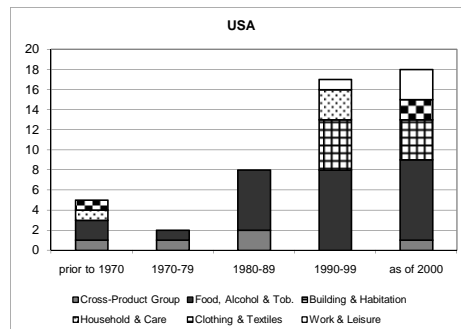
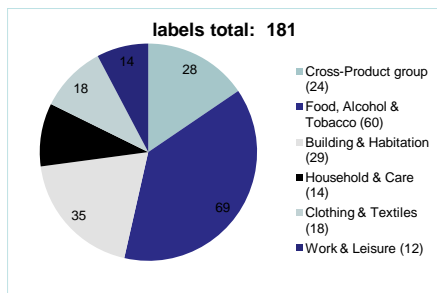
- **Quantities**
 - 14 Labels
- **Observations**
 - highly heterogenous and product specific
- **Characterisation**
 - **Scope:** rather international
 - **Introduction:** during 1990s and since 2000
 - **Format:** combinations of picture + text; partly benchmarking with quality levels (gold, silver, bronze)
 - **Products:** cut flowers, sports balls, toys, beaches, appliances in information and consumer electronics
 - **Criteria:** product specific – environmental friendly and pollutants (toys), energy efficiency (electrical appliances), social standards (sports balls)



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Conclusion 1: characterisation label landscapes

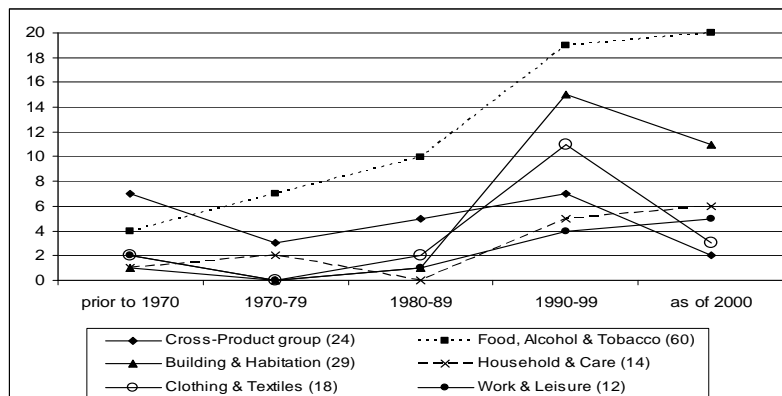
- **Country comparison**
 - Wide range of labels in Germany, USA; less in Sweden
- **Distribution label landscapes**
 - Domination of food



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Conclusion 2: characterisation label landscapes

- **Year of introduction**
 - Focus 1990s

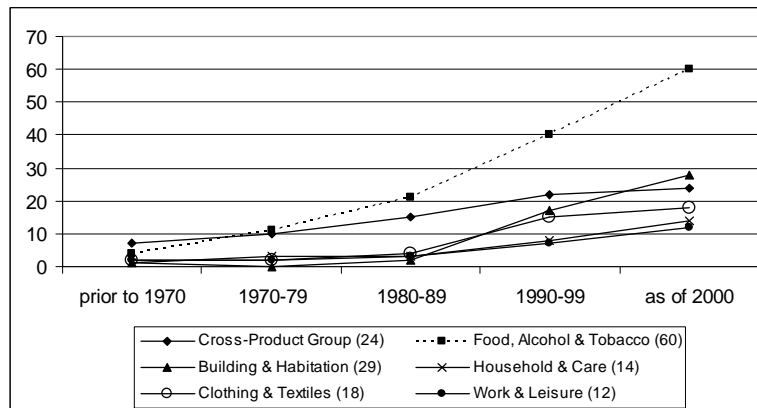


The total number of labels, for which the year of introduction is known, is given in brackets behind the meta-areas.

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Conclusion 3: Characterisation label landscapes

- Cumulative depiction of year of introduction



The total number of labels, for which the year of introduction is known, is given in brackets behind the meta-areas.

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Conclusion 4: Characterisation label landscapes

- **Objective:**
 - Mainly consumer health protection and environment
- **Products:**
 - A great variety
- **Criteria:**
 - Overarching value chain criteria: (almost) only eco-labels (life cycle)
 - Emphasis mainly on selected life phases (singular product features):
 - pollutants
 - raw materials
 - production methods
 - product consumption and use
- **Certifier**
 - Economy: initiators of most labels
 - Civil society: concentration on selected product groups and product features
 - State: emphasis on eco-labels and mandatory labelling

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3. „Label impact analysis“

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Evaluation studies: methodology

- **Goal:**
 - Compilation of evaluation studies on the effectiveness of product labels on consumers
- **Methodology**
 - **Step 1:** Search for studies
 - Scientific databases, websites of labels
 - Search words: label name + keyword (e.g. consumer, awareness)
 - 318 studies on product labels
 - **Step 2:** Selection of evaluation studies
 - Empirical analysis on consumer-related effectiveness
 - 13 effectiveness variables (e.g. awareness, purchasing behaviour)
 - 78 evaluation studies
 - **Step 3:** Assessment of evaluation studies
 - Tables
 - Findings on labels and effectiveness variables
 - Conclusions along guiding questions

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Methodology – focus on step 3

- Concept for depiction – approach „**meta-product groups**“

1) Cross-product group	4) Household & Care
2) Food, Alcohol & Tobacco	5) Clothing & Textiles
3) Building & Habitation	6) Work & Leisure

- Characterisation of labels – approach „**category development**“

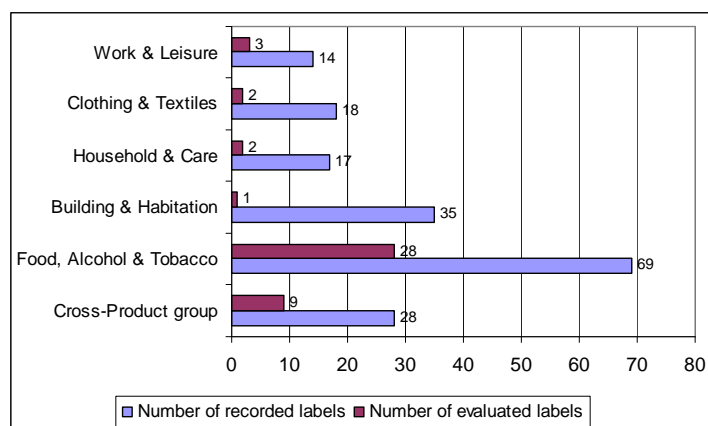
1) Label, Effectiveness Variable	3) Results
2) Methodology	4) Participants, Region

- Depiction of results

Label/Effectiveness Variables	Methods	Outcomes	Participants/Region
Sweden			
Voluntary Labels			
1) Bjørner, T. B.; Hansen, L. G.; Russell, C. S. (2004): Environmental labelling and consumer's choice – an empirical analysis of the effect of the Nordic Swan. In: Journal of Environmental Economics and Management, Vol. 47(3), pp. 411-434.			
Nordic Swan Willingness to pay	Modelling on basis of available data (January 1, 1997 to January 31, 2001) of a consumer panel of weekly purchases (purchasing diaries)	The study noticed a significantly higher willingness to pay a premium of between 13% and 18%.	On average 1,596 purchasing diaries of Danish households per week during study period

Comparison recorded and evaluated labels

- 45 evaluated labels = 25 % of recorded labels
- Main areas: food, cross-product group



Evaluated labels:

Cross product group	Food, Alcohol & Tobacco		Building & Habitation	Household & Care	Clothing & Textiles	Work & Leisure
Stiftung Warentest	Bioland	EU-tobacco labelling	Forest Stewardship Council (FSC)	Kontrollierte Labels of hazardous products	Oko-Tex Standard Pure Wear	GEEA Energy label Energy Star
EU Flower	Demeter	Keyhole Symbol				
Blauer Engel	Gää	KRAV				
GS-Zeichen	BioKreis	Rättvisemärkt				
Der Grüne Punkt	Naturland	Fair Trade Certified				
EU-energy labelling	Ecovin	Food Alliance				
CE-label	Alnatura	Dolphin-safe				
Nordic Swan	Rapunzel	USDA Organic				
Consumer Reports	Bio-Wertkost	Nutrition Facts Label				
	Naturkind	Health Claims				
	Fair Trade	Tobacco Product Labelling and Advertising Warnings				
	Max Havelaar					
	QS-Prüfzeichen					
	DLG-prämiert					
	Bio-Siegel					
	EU-food labelling					

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Evaluation studies: general characteristics

- **Year of publication**
 - Vast majority since 2000
 - Some studies 1990s and earlier
- **Methodology**
 - Quantitative and qualitative methods of empirical social research
 - Representative surveys (telephone, face to face, online)
 - Personal and written interviews (point of sale, postal)
 - Focus groups
 - Longitudinal analyses (Blauer Engel, Energy Star)
 - Secondary analyses
 - Experiments (e.g. product selection)
- **Participants**
 - General surveys
 - Specific target groups not based on socio-demographic attributes (e.g. DIY customers, smokers and non-smokers)
 - Specific groups (e.g. female students 17-25 years of age)

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Effectiveness of product labels

- **Definition effectiveness**
 - Understanding in a broad sense
 - Desirable and undesirable effects (e.g. „information overload“)
 - Diffusion: awareness of the label
 - Cognitive level: e.g. (risk-)perception, confidence
 - Action level: e.g. purchasing and usage behaviour
- **Effectiveness variables in evaluation studies**
 - Total of **13 variables** examined
 - Most frequent variable:
 - **Awareness** (32 labels)
 - Additional focus:
 - **Purchasing behaviour, confidence, willingness to pay, understanding** (16-18 labels each)
 - Perception (8 labels), usage behaviour (6 labels)
 - Isolated:
 - **Product associations, knowledge, assessment, loyalty, information behaviour, signalling**

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The case of the US-Energy Label

- **Evaluated for:**
 - awareness,
 - understanding,
 - purchasing behaviour,
 - willingness to pay,
 - loyalty,
 - product associations.

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awareness & understanding

• Awareness

- Ritter *et al.* (2003) identified a degree of aided awareness of 26%.
- 44% of the purchasers of electrical appliances recognised the label in an aided situation (US Department of Energy 1999)
- aided awareness of the label rose from 41% in 2000 to 74% in 2007, unaided from 25% (2001) to 58% (2007) (EPA 2001–2008)

• Understanding

- 48% correctly interpreted unaided its intended meaning.
- proportion of respondents who know absolutely nothing about which product qualities Energy Star indicates, fell from 42% (2000) to 24% (2007);

Year	Mentions with a high understanding					
	Energy efficiency (%)	Environmental advantages (%)	Save money in product use (%)	Energy and environment-related product standards (%)	Energy savings (%)	Energy savings with no link to product use (%)
2007	62	12	9	7	5	3

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purchasing behaviour & willingness to pay

• Purchasing behaviour

- office appliances: 38% of Austrian households familiar with the label refer to the label in their decision-making
- In 2000 50% say that the Energy Star at least influenced a purchasing decision; by 2007 this proportion has grown to 72% whereby 40% report “very much” and 32% “somewhat”.

• Willingness to pay

- purchased a discounted Energy Star product: More than 60% indicate that they would have taken a decision “very likely” or “somewhat likely” to purchase an Energy Star product even without a discount.

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loyalty & product associations

- **loyalty**
 - EPA 2001–2008: very high willingness amongst respondents who purchased an energy star product to recommend it to a friend (“loyalty”).
- **Product associations**
 - to fridges, washing machines and dishwashers, which were mentioned the most frequently in the respondents who are familiar in an aided manner with the label.
 - association rates unaided are far lower than aided: washing machines 35%, fridges 34%, dishwashers 20% (2007)

Most frequent product associations with the Energy Star

Appliance	2007 (%)	2006 (%)	2005 (%)	2004 (%)	2003 (%)	2002 (%)	2001 (%)
Fridge	80	74	72	63	63	54	47
Washing machine	73	63	60	49	49	37	34
Dishwasher	70	58	57	50	46	43	33

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4. Conclusions & recommendations

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Most successful labels

- **Definition „successful label“**
 - Changes in behaviour corresponding to objectives
- **Objectives**
 - Health, environment, social, safety at work, animal welfare, freedom of information
- **Effectiveness variables**
 - Awareness, purchasing behaviour, usage behaviour

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Most successful labels: overview

Label	Effectiveness Variables	
	Awareness	Changes in Behaviour
Objective Health (+ Safety at Work or Animal welfare)		
KRAV	96 % *	
GS-Zeichen	87,2 %	
VDE	74,5 %	
CE mark	63,4 %	
DLG	51 %	
Demeter	46 %	
PURE WEAR	40 %	
Consumer Reports		
Nutrition Facts Label		
EU Tobacco Labelling		
US Tobacco Labelling		
Hazardous Products Labels		
Stiftung Warentest	90 %	
Dt. Biosiegel	87 %	
Bioland	88 %	

Label	Effectiveness Variables	
	Awareness	Changes in Behaviour
Objective Environment		
Nordic Swan	90 % and more	
EU Energy Label	84 %	
Energy Star	74 %	
Blauer Engel	83 %	
Objective Social		
Max Havelaar	88 %	
Rättvisemärkt	69 %	
Fair Trade Label		

* When there were several entries for the degrees of awareness, the highest value was entered.

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Characteristics of successful labels

- **Scope:** successful labels confirmed for Germany, Sweden, USA; product labelling deep rooted in developed industrial countries
- **Year of introduction:** successful labels are mainly the older ones; 9 out of 22 are older than 30 years
- **Format:** mainly combinations of text and picture (14 labels); pure text marks (5 labels) and pure pictorial marks (3 labels) rare
- **Products:** successful labels in all meta-areas; prevalence of organic food and fair trade
- **Criteria:** no specific successful patterns; labels based on statutory provisions and labels based on own criteria
- **Certifiers:** all types of certifiers represented („state“, „industry“, „civil society“); state certifiers important to guarantee independence from economic interests

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Recommendations for public authorities/political decision makers

- **Which labels have proven their effectiveness?**
 - Eco-labels, comparative product labelling, test labels, labels of organic farming and fair trade, usage informations, warnings
 - Positive labelling of special product features (e.g. health, safety)
 - Negative labelling in the sense of hazard control
- **Which label types for which products?**
 - Food: labels of organic farming and fair trade
 - Consumer products: eco-labels, test labels, comparative product labelling, mandatory tobacco warnings
 - Chemicals: eco-labels, usage informations, warnings

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„Rules of thumb“ for public authorities/political decision makers

- ☞ Effectiveness variable awareness – conditio sine qua non
- ☞ Preference for picture and text combinations
- ☞ Effectiveness differences – labels oriented towards priority target groups
- ☞ Competing influences: label, price, brand, point of sale
- ☞ Willingness to pay confirmed for objectives environment and fair trade
- ☞ Confidence is the precondition for influencing behaviour
- ☞ Keep labels simple – but complex labels can be successful, too
- ☞ Objective health: labels promote healthier living
- ☞ Benchmarking approach trend – direct quantitative product comparison

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Recommendations for public authorities

- **Continuously forge awareness of product labels and promote it again and again**
 - Provide permanent marketing budgets for labels
- **Communication of clear messages as picture and text combinations**
 - Qualifying, confusing or contradictory statements leads to a loss of label credibility
- **Identification of priority target groups and orientation of the label towards these groups**
- **Trust especially important for effectiveness of food, alcohol & tobacco labels**
 - State certifiers should proactively communicate their role and present themselves as being free from economic interests

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Recommendations for Research

- **Scarcely evaluated labels**

- Researched: state labels + fair trade + food

- **Recommendations:**

- Setting up of a monitoring system
- More extensive evaluations on consumer health protection (information phase, purchasing behaviour, usage behaviour)

- **Product labelling and risk communication**

- Ongoing evaluation of product labels is necessary

- **Recommendations:**

- Generation of knowledge for effectively influence consumer behaviour
- Label evaluation in conjunction with assessment of other product-related tools
 - Consumer advice, campaigns, consumer education, consumer requirements
 - Approval restrictions, product standards, warranties, recycling quotas, advertising regulations or sales restrictions

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Thank you very much!

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